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Stagnant Membership and Red Ink

New Chief Aims to Rejuvenate a Troubled AAAS

Embracing all the sciences, while reaching out to the general public on scientific issues, the American Association for the Advancement of Science is a unique organization—a \$30-million-a-year conglomerate of 300 affiliated societies, a staff of 240, and a direct membership of 132,000. Its most visible product, the weekly Science, is a major journal for primary scientific publication and coverage of science-related news. In Washington, the AAAS is a pillar of the scientific establishment.

Not well known, however, is that the AAAS, holding its 156th annual meeting this week in New Orleans, has been stagnant in membership size for over a decade; and, until last year, it had been running an operating deficit for a similar period. Last May, a new Executive Officer, Richard S. Nicholson, formerly a senior NSF official, took office, following the abrupt, unexpected departure of Alvin Trivelpiece, who left after 18 months to become the Director of the Oak Ridge National Laboratory. These various circumstances have led the AAAS to intense introspection on its role and future.

SGR Editor Greenberg discussed these and other matters February 6 with Nicholson. Following are excerpts from that conversation, transcribed and edited by SGR.

SGR. What was the most urgent issue when you got here?

Nicholson. The highest priority was to get the operating budget in the black. When I came in, there had been ten consecutive years of red ink in the operating budget. The AAAS has an investment portfolio of about \$20 million that

has been invested wisely. The growth has more than compensated for the red ink in the operating budget.

SGR. You were getting by on the rising market.

Nicholson. That's right. If you looked at the net worth of the organization, it wasn't in the red. The net worth actually increased every year. The organization had an operating budget, but at the end of the year wouldn't have lived within it, ten years in a row. Growth of the portfolio filled the gap, but the fact remains, there was this absence of discipline here. When the Board of Directors hired me, they made it

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In Brief

Former NIH Director James B. Wyngaarden, on the job only since December as Associate Director for Life Sciences at the White House Office of Science and Technology Policy (OSTP), has a new job awaiting him in July: Foreign Secretary of the National Academy of Sciences, for which the recently completed mail-ballot count shows him the winner. Wyngaarden told SGR he plans to leave OSTP for the Academy post, which is customarily a part-time job.

The Reagan Administration sold the Superconducting Super Collider (SSC) to Congress with assurances of European cost-sharing, though European officials indicated no interest in the venture. Now the word from the Bush Administration, via Congressional testimony February 7 by OSTP Director D. Allan Bromley, is that Europe will not provide "a major contribution," but Japan will "play a major role," while the Soviet Union will also participate. Meanwhile, cost estimates for the SSC are up a billion or two over the previously stated \$5.9 billion. Political support for the Texas-based colossus remains powerful, but, with the SSC's magnet technology still troublesome, doubts are again rising about political viability in another year of budget strife.

The National Institute of Standards and Technology (NIST), refashioned by Congress from the old National Bureau of Standards to serve as a focal point for federal-industrial collaboration, remains a pygmy in the budget listings, despite a plump 20 percent increase proposed for next year. In a press release, Acting Director Raymond Kammer expressed appreciation for the boost, which would raise the budget to \$198 million, but noted that up to the present "our appropriated funding has stayed essentially flat; we are still operating on a budget from 1975."

The Grant Swinger Papers Published in New Edition

A new and expanded collection of *The Grant Swinger Papers*, a 40-page edition containing 14 selections by and about the legendary Director of the Center for the Absorption of Federal Funds (CAFF), is fresh off the press. Produced in collaboration between CAFF and *Science & Government Report*, the new edition includes several classic interviews with Swinger, among them: "Grant Swinger Surveys the Reign of Reagan," "Gold in the Greenhouse Effect," and "Cold Fusion and Other Matters."

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... Seeking Coherence in a Diversity of Programs

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very clear to me that elimination of the operating deficit was a high priority. Also, as the new Executive Officer, I felt it was important to start out by saying I believe in the business approach to things. I made some adjustments after I got in.

SGR. You took a Gramm-Rudman approach—deficit reduction?

Nicholson. Deficit reduction. In fact, I made a reduction, two percent across-the-board. I emphasized to the staff: It's not a crisis, but it's still something we have to do. We don't have the returns for 1989 yet, but I'm fairly confident that we now operate in the black. I reduced my personal staff by three people. And I decided not to replace Tom Ratchford [Deputy Executive Officer], when he left [last December to become an Associate Director of the White House Office of Science and Technology Policy]. I stopped the *Observer* [established in 1987, a bi-monthly on AAAS affairs, distributed free to the membership]. That saved \$300,000 a year. Altogether, it wasn't a huge sum that was saved. But it was a function of people believing that I was serious about operating in a business-like way and not having red ink every year. The other thing that I wanted to do—this is still in process—is bring more coherence to the various programmatic activities.

The Association over the years has started and continues to do a number of diverse things, from education and opportunities for women and minorities to freedom and responsibility of scientists, working with museums, administering Congressional fellowships, and on and on. They started at different times and got lives of their own, and some were really small activities, where there wasn't very much flexibility in terms of resources available. They didn't have any coherence in the sense that you say, why are we doing this? Does it fit with where we, as an Association, think we ought to be going, and with what our priorities are? What are the things that, in a broad sense, are the most important to us for the foreseeable future? Until you do that, it's hard to answer how much longer should we continue arms-control [studies], how much longer should we continue Congressional fellows?

In cooperation with the Board of Directors, we've agreed on three broad areas to be the priorities for the AAAS: Education and human resources; science and policy, and international. I took all the existing activities and put them into those three clusters. My belief is that those are reasonable representations of where AAAS should be headed for the next five or ten years.

When AAAS engages in something, it has to ask itself what value added does it bring to that issue, because there are a lot of players. I think we have to be focused on matters that are of a kind of generic interest to the whole community of science, mathematics, and engineering. If it's an issue that's really mostly physics, then I would expect the Ameri-

can Physical Society or some other society to focus on that. Education is the area that, whether you're talking to a physicist or an anthropologist, or whatever, they're all concerned about it. So, that's one of our highest priorities.

SGR. Are you looking for uniqueness in AAAS activities?

Nicholson. When we have ideas, I want to have lots of tests to apply to them that range from what's the value that we bring? If we don't do it, will somebody else do it? If nobody does it, does it matter? I want to have more of a business sense, frankly, in the things that we do. Before we start something, we try to have a business plan, and try to understand what we're getting ourselves into. Certainly, we're not a profit-making company, and so it's okay to subsidize some things.

SGR. What's an example?

Nicholson. Project 2061 [a AAAS-directed science-education project, named after the year in which Halley's Comet will again be visible from earth], which was started before I came here. The concept is that we're not going to have a national curriculum, but we can have national goals. That's now the conventional wisdom since the President's [education] summit. This idea precedes that by several years. The first phase of 2061 was to try to identify what the outcome ought to be in an educational system. Not how you do it, but what the accomplishments ought to be. In phase two, the AAAS is going to six cities around the country, selected to represent different settings—urban, rural, an area where there are many minorities, and so on. The idea is to put together teams there and involve teachers from every level, principals, school superintendents—the whole set of players. And then say to them, here's what we think the outcome ought to be in terms of the science and mathematics that children in the system ought to have acquired. And now let's, in this local setting, design a curriculum that will achieve that result, a curriculum that's appropriate to the people you have here, the size of your schools.

It's a very long-term project. And that's its great virtue. It's not a quick fix. Phase two is about three years. Phase

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| Editor and Publisher | Associate Publisher |
| Daniel S. Greenberg | Wanda J. Reif |
| European Correspondent | Circulation Manager |
| Francois Seguier (Paris) | Glen D. Grant |

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... AAAS to Launch Electronic Science Journal

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three is to try to get the best outcomes of these six sites replicated around the country.

SGR. *How is this financed?*

Nicholson. The cost for Phase two, which is over three years, is about \$10 million. We have funding from the National Science Foundation, Carnegie Corporation, Ford, Mellon—it's from lots of them, not from just one place. The local communities are putting in money, too. Pick up *Time* magazine, talk to people in the education community, and 2061 turns out to be a very well-known activity. It's one of the better ideas that exist. It has a chance of really making a difference.

SGR. *What will be the role of the AAAS international group? Where will you find the unique function?*

Nicholson. I don't know the answer to that. We have a set of activities now, some of which are unique. We have a program where we have gotten a number of our affiliated societies to contribute their publications—they go to a central warehouse that we operate—and then they're shipped to scientists in sub-Saharan Africa. Why do that? That's probably something that takes a AAAS, because you want all the disciplines. Chemistry or physics alone could do it. But it wouldn't have the impact. It's probably a good example of a kind of thing that we could do that otherwise wouldn't get done. But I want to make sure we don't become a job shop and get too driven by grant money, which can happen. The third thing I want to do is start some new ventures. There are a lot of ideas of things we could do.

SGR. *What are they?*

Nicholson. I've got a group of staff that I've put together, and I'm charging them with coming up with ideas for new ventures that we could undertake that would be consistent with the goals of the Association. The Association is really very healthy. We've got \$20 million in the bank. We can invest some of that money in new things.

SGR. *Is a new venture in the works?*

Nicholson. We're going to enter into a joint venture with an organization called OCLC—Online Computer Library Center, in Dublin, Ohio. It's a major resource for libraries, especially for research libraries around the country, which are all online and connected for locating and sharing materials on interlibrary loan. We're going to enter a joint venture with them to publish an electronic scientific journal. To publish something electronically is not a new idea. Most people feel it's not if, it's when, because the day surely will come when most of the information you get comes on your screen.

SGR. *Will this be in conjunction with Science magazine?*

Nicholson. No, it will be independent of *Science*.

SGR. *Would Science exist in parallel, continuing as a publication produced on paper?*

Nicholson. *Science* would exist in parallel on paper and

we might publish the table of contents for the electronic journal in there. The electronic journal is a journal that's updated instantly. When a paper is accepted, it appears. So, it doesn't come out weekly or monthly, it comes out daily.

SGR. *Wouldn't this create a serious competitor for Science? An author would face the choice of where to submit.*

Nicholson. Yeah. But, he now thinks about whether to do it for *Science* or a journal of the American Chemical Society, or what else.

SGR. *Would the electronic journal also carry advertising?*

Nicholson. Where this stands now is, we're going to enter a joint venture with OCLC. What they bring to the table is the technology for distributing things. We bring the scientific credibility, the peer-review process, and that sort of thing. And this is going to be announced at the New Orleans meeting. What we're going to announce is that we're going to enter a joint venture to do this. We're not going to announce the business plan or how we would finance it. It should start in about another year.

SGR. *Is this intended to be a financially self-sustaining venture?*

Nicholson. Probably. My view is that when we start something new, we should be like a business in the sense that we try, as well as we can, to have a business plan which is hardnosed. It's conceivable that in an organization like this we might say that if it's close enough and important enough, we're willing to sustain a loss. We can do that. We just can't do it for everything.

SGR. *Then you'll have two similar editorial operations here, one electronic, the other in print.*

Nicholson. With different emphases. One of the interesting things about an electronic magazine is that it's always there and always changing.

SGR. *Would editorial control belong to the AAAS?*

Nicholson. The editorial would be our responsibility.

SGR. *Will the electronic magazine emulate some of the important features of Science, for example, the weekly editorial, letters to the editor, News & Comment, Research News, book reviews?*

Nicholson. The precise details of what the book will look like are being worked out. There are a lot of questions we haven't answered yet. Do you have advertising in it or not? How do you do it, if you do it? That's an important question in a generic sense, if it's really true the world will become more and more electronic in the future. Whether it will just be research papers or have News & Comment remains to be worked out.

The basic decision is that we believe the two organizations—I hate to use the word—have synergism. It's not inconceivable that as we try to sit down and develop a

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... Cause Unclear for Lack of Membership Growth

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business plan, we say it's going to cost more than it's worth, or won't work. But it's our intention to do it.

Another thing I'm exploring is a publication we presently have, *Science Books and Films*, which is a really high-quality journal that's not read by very many people. We're going to try to expand the readership.

SGR. *The membership of the AAAS has remained around 130,000 for many years, in a period of enormous growth in the pool of prospective members.*

Nicholson. I wish I knew the precise answer to that, because then I would know how to address the problem. There's probably not a simple explanation. One of the factors is the increasing specialization in societies and associations. It used to be that if you were a chemist, you joined the American Chemical Society, and then maybe the second society you joined would be the AAAS. Now, in a lot of cases, if you're a chemist you join another specialty society. So, we become third, and then economics enters into it. I think that's a factor, but I doubt that there's a simple explanation.

I certainly would hope that under my tenure it can grow. But the way to do that is, you don't sit and worry about how you're going to get it to grow in a marketing sense. I think you try to make people more aware of the things you do. And you ask more from the members, and by asking them to do more, you get them more involved and more aware of what the Association is doing. I believe scientists have a sense of a *pro bono* responsibility, to give something back to society and to science. I think that's why a lot of people are members. It's not just to get *Science* magazine.

SGR. *Has a systematic effort been made to find out why more people don't join or don't renew their membership in the AAAS?*

Nicholson. We've done surveys to find out why people don't renew their membership. The trouble is you get complex answers that don't reduce down to—. If I knew the thing, I'd go out and fix it. Sure, *Science* magazine is very important for attracting and holding members. It's our biggest and most important property and it's the highest priority to maintain its strength. In parallel with that, I want to start these other things, but certainly not at the expense of *Science* magazine. The world changes. The magazine might not—who knows? So, I think it's important that we diversify.

SGR. *But is anybody worried that membership growth is eluding you?*

Nicholson. I'm worried about it. And I think I'm doing things. Under [Alvin] Trivelpiece [Nicholson's predecessor as Executive Officer], they did a survey and they found that members were unaware of all the various things the AAAS does. But when told about them and asked if they would like to see their dues spent that way, they supported basically everything we do. That's the origin behind the feeling that if

we just got our story out better, you'd have more members.

SGR. *Wasn't the AAAS Observer, which has been terminated, intended to deal with the problem of keeping the membership informed?*

Nicholson. It was intended to deal with that. As I said, I had to make some tough choices, because I was committed to having a balanced operating budget. I believe it's important to get our message out, but I believe it can be done just as well or more effectively by using the pages of *Science* magazine, which we know a lot of people read.

There is an argument for not doing that—not wanting to convert it into a house organ. I believe you can communicate, if you do it well and carefully, without turning it into a house organ, because a lot of things we do are just as interesting as the news pages. If you approach it from that point of view, I think that's as good as or better a vehicle for getting the story out than the *Observer* was.

Another thing I have under way is a task force, chaired by "Mim" Daddario (former Democratic Congressman from Connecticut and former AAAS President). It's called Governance. It's looking at ways we can get more involved with the membership. My belief is that by getting them more involved over time, membership can grow.

SGR. *Over the last 10-20 years, first-class research has become dispersed around the world, but the change is only dimly reflected in Science, in research papers and in foreign news coverage, provided by one correspondent in Europe. That's in contrast to Nature, which is strongly international, published in a number of places around the world, and with correspondents around the world. Science has meanwhile continued to focus on what's going on in the US.*

Nicholson. Yeah.

SGR. *Nature has stationed a correspondent in Tokyo for many years. Except for rare, short visits, Science has no coverage from there. That's an enormous and persistent gap.*

Nicholson. That's an item of active discussion—how to move more into that international area. The debate is not whether but how—how to do it from a business point of view as well as from an editorial point of view. The whole world has gotten so international that I think we have to do that better than we've done in the past.

SGR. *The AAAS has mainly raised its own money and has relied little on foundations and other sources.*

Nicholson. That's true, but the trend is away from that. 2061 is mostly funded by external sources. The amount of grant money has gone up in just a few years to about \$6 million out of a \$30 million AAAS budget for everything. That's the trend. I have a concern about that. If you're too dependent on "soft" money, you can find yourself doing things that aren't that central to your mission.

I think the grant money can grow more than it is now, but I want to keep my eye on it to make sure it's supporting things that we want to do.

Bush Names 13 to New Science Advisory Council

At last delivering on an election-campaign promise (no hurry in this sector of White House affairs), President Bush has announced appointment of a 13-member President's Council of Advisers on Science and Technology—which acronymically becomes PCAST. The membership is typical Bush—mainstream high achievers, most with extensive experience in or near government.

The Council, announced on February 2, is chaired by D. Allan Bromley, the President's Science Adviser. But, with attention to Washington's chain-of-command sensitivities, a White House announcement noted that PCAST “will be the first Presidential science advisory group in many years to report directly to the President.” The President, off on a flying speaking tour, delegated the swearing-in duty to Vice President Dan Quayle, who presided at a ceremony held on the day of the announcement.

The “many years” referred to in the announcement date back to 1972. That's when Richard Nixon, angered by leaks and his perception of disloyalty to his Administration, terminated both the White House science office and what was then called the President's Science Advisory Committee.

In collaboration with Congress, the office made a full comeback as the presentday White House Office of Science and Technology Policy (OSTP), but the advisory body, renamed the White House Science Council, was whittled down to the role of adviser to the President's Science Adviser; it never amounted to much.

Following the announcement of the PCAST appointments, the members went to Camp David, where it's reported they met with President Bush. OSTP, which provides staff support for PCAST, was silent on the topics covered. So were the newly appointed members who, it may be assumed, have been reminded of the loose-lip allegations that led to the demise of PCAST's advisory ancestor. Members of PCAST are:

Norman E. Borlaug, agricultural scientist, recipient of the 1970 Nobel Peace Prize, head of the International Maize and Wheat Improvement Center, Mexico, 1964-79. He is currently leader of the Sasakawa-Global-2000 agricultural program in sub-Saharan Africa.

Solomon J. Buchsbaum, Senior Vice President, AT&T Bell Laboratories, since 1979. During the Reagan Administration, he chaired the White House Science Council.

Charles L. Drake, Professor of Earth Sciences, Dartmouth College.

Ralph E. Gomory, who became President of the Sloan Foundation last year after retiring from IBM, where he was Senior Vice President for Science and Technology. Active in White House science advisory affairs under Reagan, Gomory, following Bush's election, was regarded as a possible choice for presidential Science Adviser in the new Administration.

Bernadine Healy (PCAST Vice Chairman), Chairman

of the Research Institute of the Cleveland Clinic Foundation, and Deputy Director of OSTP in the Reagan Administration. Healy is mentioned occasionally as a short-list choice for the long-vacant directorship of NIH, but she's reported to favor remaining in Cleveland.

Peter W. Likins, President of Lehigh University, former Provost of Columbia University. An engineer, he's put Lehigh in the vanguard of academe as a base for high-tech regional economic development.

Thomas E. Lovejoy, Assistant Secretary for External Affairs at the Smithsonian Institution. He's President of the Society for Conservation Biology and is a senior member of the Washington environmental establishment.

Walter E. Massey, Vice President of the University of Chicago for Research and for the Argonne National Laboratory, which Chicago manages for the Department of Energy. He's President-elect of the American Physical Society and a former President of the AAAS.

John P. McTague, Vice President for Research, Ford Motor Co. He served with OSTP from 1983-86, departing as Acting Director.

Daniel Nathans, a molecular biologist at Johns Hopkins Medical School. He received the Nobel Prize for physiology or medicine in 1970.

David Packard, a founder and Chairman of Hewlett-Packard. He was a personal adviser to Reagan on high-tech and related business matters, and worked closely on the White House Science Council with fellow member D. Allan Bromley.

Harold T. Shapiro, President of Princeton University, former President of the University of Michigan. He's an economist—and the only social scientist on PCAST.

Job Changes & Appointments

John W. Lyons was confirmed by the Senate on February 9 as Director of the National Institute of Standards and Technology, succeeding **Ernest Ambler**, who retired last April. Lyons spent 18 years with Monsanto before becoming head of the Engineering Laboratory at NIST's predecessor, the National Bureau of Standards, in 1977.

Robert C. Ketcham, a long-time staff member on the House Science, Space, and Technology Committee, has been appointed Committee Chief of Staff, succeeding **Harold Hanson**, who recently retired.

Nominated for the remaining two vacancies among the four Associate Director slots at the White House Office of Science and Technology Policy: **William D. Phillips**, a veteran industrial researcher (Du Pont, 1951-78), who most recently has been Science Adviser to the Governor of Missouri, and **Eugene Wong**, Chairman of Electrical Engineering and Computer Science, UC Berkeley. The Senate Committee on Commerce, Science, and Transportation has scheduled their confirmation hearings for February 28.

Bromley Reports Ambitious Science-Policy Agenda

D. Allan Bromley, the President's Science Adviser, testified February 7 at the annual "R&D Posture" hearing of the House Science, Space, and Technology Committee, an event that, as usual, drew a large audience of Washington science watchers yearning for policy clues.

As the sole witness in the proceeding, Bromley dispensed many of them, spinning the impression that his office is a powerhouse of activity, effectively connected to the Bush inner circle. Attending in larger numbers than usual, and actually sitting and listening for long spells of the two-and-a-half hour proceeding, the Committee members thus rendered a sign of deference to Bromley, who is both Director of the Office of Science and Technology Policy (OSTP) and a Special Assistant to the President. But, in fact, there's little evidence so far to indicate that he is the influential wizard of the Bush Administration, as much as the House Committee would like to have one in its statutory jurisdiction.

The tidbits he dropped sounded agreeable enough, as when he reported that OSTP is "reviewing the relationship between the programs of the Department of Education and the National Science Foundation in science, mathematics, and engineering education and, together with these agencies, taking steps to improve coordination of their educational activities."

Congressmen concerned about science education know that the relationship between the two agencies has not lacked previous reviews, all of which have failed to stir the cash-laden Department of Education to take science education seriously, as does NSF. Rep. Doug Walgren (D-Pa.) observed that the Department of Education does little about science education. Bromley nodded, and proceeded to praise the Department of Energy for expanding its role in education.

Bromley also took a cheerful stance on agricultural research, noting that the Administration has budgeted \$50 million for USDA competitive grants, as a first step toward a 10-year increase to a total of \$500 million. Observing that the "agricultural community has perhaps been a little slow" in picking up on advances in the life sciences, he urged the Congress to support the growth in competitive grants. Not present was the man who has the final say on that, Rep. Jamie L. Whitten (D-Miss.), Chairman of the House Appropriations Committee and the Subcommittee on Rural Development, Agriculture, and Related Agencies. During the 10-year existence of USDA's competitive-grants program, Whitten has held it down as a threat to traditional, problem- and site-specific farm research. There is nothing to indicate that his mind will be changed by further adulation of competitive grants from scientists who deprecate the kind of research Whitten thinks best.

On a favorite topic of the House science committee, commercial technology transfer from federal laboratories, Bromley said that there has been a lot of talk and agitation,

but few effective results. He said he wants to "catalyze" state technology programs to speed up transfer from federal labs, which he said number 762.

Another item that came up was the tattered US reputation as a reliable partner in big international projects. The topic was fresh in the Committee's mind because of a hearing it held the previous week at which representatives of European and Japanese space agencies assailed the US for unilaterally scaling down plans for the manned space station. Typical of the witnesses, who appeared before the House Committee on January 30, was Reinhard Loosch, Director of International Cooperation in the West German Ministry of Research and Technology.

Recalling that strong urgings from the Reagan Administration helped draw Europe into an expensive collaboration on the space station, Loosch admonished the US for a "descoping" of the project that could mean wasted European efforts. Declaring that "Partners do not operate at arm's length," he added, "Nor do they take decisions unilaterally that will damage the investment or otherwise adversely affect the interests of the other partners. Neither do they simply shift their own difficulties onto their partner's shoulders."

Bromley, asked by Rep. Robert Roe (D-NJ), Chairman of the Science Committee, to address the issue of international cooperation, lamented that the US has a reputation as an "unreliable partner." He urged adherence to sci-tech agreements. Not long after that, however, under questioning about backing out of a deal with Japan on the Fast-Flux Test Facility in Washington, Bromley said he viewed that move "with a degree of sorrow," because "it broke a commitment to colleagues in Japan." But, he said, given the Department of Energy's budget problems, there was no choice.

Rep. David E. Price (D-NC) asked Bromley about the availability of social-science expertise in the White House science-advisory system. Bromley replied that he's all for it, but added that so far there's only one social scientist on the OSTP staff, at a middling level, plus an economist, Harold Shapiro, President of Princeton University, on the newly appointed President's Council of Advisers on Science and Technology. Bromley added that he hoped eventually to have an Associate Director for the social sciences.

Respectful and collegial with the Committee, in contrast to his Reagan-Administration predecessors, who treated it as low-brow nuisance, Bromley gets high marks from the members, with few hard questions. They even let him get away unscathed on the issue of the Pentagon's grip on federal R&D spending—down slightly, but still taking about 61 percent of the total. Obviously anticipating the Committee's interest into this antiquated division, Bromley declared in his prepared text: "A recent OSTP analysis found the balance of defense to non-defense R&D to be appropriate to the relative needs and objectives of defense and non-defense programs."—DSG

More In Print: US-Japan Ties, HDTV, Cancer Data

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the FS-X Program (GAO/NSIAD-90-77BR, 49 pp., no charge), unclassified version of a report requested by half a dozen members of Congress concerning the US-Japanese collaboration on development and production of 130 fighter planes derived from the F-16 design. The agreement, hovered over by anxious Congressmen, has been denounced as a give-away of American technology that will accelerate creation of a Japanese advanced aircraft industry, and defended as a cost-sharing bargain that will give the US access to several superior Japanese technologies. GAO reports doubts about the existence of the latter. Regarding costs, it notes that codevelopment will cost Japan far more per plane than outright purchase, thus suggesting that the Japanese are more interested in learning aerospace than in acquiring aircraft.

Another from GAO: **High-Definition Television: Applications for this New Technology** (GAO/IMTEC-90-9FS, 11 pp., no charge), requested by Rep. Edward J. Markey (D-Mass.), Chairman of the Energy and Commerce Subcommittee on Telecommunications and Finance, who asked GAO to identify uses of HDTV and the potential effects that a HDTV production standard would have on non-entertainment applications in the US. Based on inquiries to 13 academic and industrial organizations, the GAO report lists uses ranging from warfare to medicine; regarding the standards issue, GAO said it found a wide range of opinions.

Newly available: GAO's **Annual Index: Reports Issued in FY 1989** (GAO/OPA, 155 pp., no charge), covering a great range of government activities, including the categories Science, Space, and Technology; Energy; and Natural Resources and Environment.

Order GAO reports from: GAO, PO Box 6015, Gaithersburg, Md. 20877; tel. 202/275-6241.

The Costs and Effectiveness of Cervical Cancer Screening in Elderly Women (GPO Stock No. 052-003-01176-0; 87 pp., \$4.25), from the Congressional Office of Technology Assessment, latest in its series on Preventive Health Services Under Medicare, concludes that the screening is medically beneficial and cost effective. (Starting in July, Medicare will reimburse the cost of Pap tests if the patient has not received a Medicare-covered Pap test within the previous three years.)

Order from: USGPO, Superintendent of Documents, Washington, DC 20402; tel. 202/783-3238.

Cancer Facts and Figures—1990 (31 pp., no charge), annual from the American Cancer Society, listing incidence of cancers by geographic region and body site, plus survival trends, suggestions for prevention, obtaining treatment, etc.

Order from: American Cancer Society state or local divisions, all accessible on 1-800-ACS-2345.

The German Research Service: Special Science Reports (monthly, \$56 per year, in English), supported by a consortium of major government and private research organizations in West Germany, provides brief, non-technical summaries of research programs and high-tech industrial activities in West Germany.

Order from: Special Science Reports, The German Research Service, Ahrstrasse 45 (Wissenschaftszentrum), Postfach 20 50 06, D 5300, Bonn, Federal Republic of Germany; tel. (02 28) 30 22 10.

Developing New Contraceptives: Obstacles and Opportunities (193 pp., \$19.95), by the Committee on Contraceptive Development, National Academy of Sciences, warns that legal and political pressures have virtually eliminated contraceptive research in the US, creating "major gaps in the ability of people to control fertility safely, effectively, and in culturally acceptable ways." Among the recommendations: FDA approval if the benefits outweigh the health risks of pregnancy, and federal legislation that would enable manufacturers to use FDA approval as a defense in product-liability suits—most improbable in the Bush Administration.

Also from the Academy: **Human Factors Research Needs for an Aging Population** (85 pp., \$15), cites neglected research opportunities for promoting the health of the nation's increasing elderly population, including changes in construction design to reduce injuries from falls, use of fire-retardant materials, easier-to-read medical labels and highway markings. The study was supported by the National Institute on Aging, the Kellogg Foundation, and internal funding from the Academy.

Order the Academy publications from: National Academy Press, 2101 Constitution Ave. NW, Washington, DC 20418; tel. 1-800-624-6242; in Washington, DC, 334-3313.

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In Print: New *Science Indicators*, PhD Lag, NASA

The publications listed are obtainable as indicated—not from SGR.

Science & Engineering Indicators—1989 (GPO Stock No. 038-000-00583-9; 415 pp., price not yet available), published by the National Science Board, the board of directors of NSF, the ninth biennial collection of just about all the numbers and trends that can possibly be gathered concerning R&D spending, employment, education, research papers, patents, high-tech exports, public attitudes, etc.—all covered in analytical text and tables. The focus is on the US, but included are many international comparisons. This is *the* big book of R&D data (65 pages bigger than the 1987 edition), a must for policymakers, researchers and managers, and interested onlookers. As in past *Indicators*, the links between volume of spending and desirable results remain elusive, a point ruefully acknowledged by NSF Director Erich Bloch at a briefing last week. NSF formerly gave away these well-edited, handsomely printed volumes, in support of its mandate to enhance public understanding of science. But, beyond a small number for government officials and the press, no more freebies in the era of Gramm-Rudman. Fresh off the press, it is due any day for sale by the US Government Printing Office.

Order from: USGPO, Superintendent of Documents, Washington, DC 20402; tel. 202/783-3238.

The PhD Shortage: The Federal Role (25 pp., plus appendix, no charge for one or two; \$2.50 each for more), a "Policy Statement of the Association of American Universities," 56-member league of big dippers in federal R&D funds, reiterates warnings of a looming PhD gap, calls for more federal support, and cautions that "it is unwise national policy to rely so heavily on imported talent"—though that, of course, is the de facto strategy currently in effect for dealing with the problem. The report includes an agency-by-agency list of federal support for graduate education, including disciplines, number of fellowships, stipends, and institutional allowances.

Order from: AAU, Suite 730, One Dupont Circle, Washington, DC 20036; tel. 202/466-5030.

Changing America: The New Face of Science and Engineering (46 pp., no charge), final report, two years in the works, by the Congressionally established Task Force on Women, Minorities, and the Handicapped in Science and Technology, recommends a variety of federal programs, in collaboration with industry and state and local agencies, to draw more science and engineering students from groups now underrepresented in these professions.

Order from: Task Force on Women, Minorities, and the Handicapped in Science and Technology, 330 C St. SW, Washington, DC 20201; tel. 202/245-7477.

Reshaping School Mathematics: A Philosophy and Framework for Curriculum (59 pp., \$7.95, plus \$2 postage), latest in a series from the Mathematical Sciences Education Board, National Academy of Sciences, this one addresses curriculum change, teacher education and assessment, and instructional materials.

Order from: National Academy Press, 2101 Constitution Ave. NW, Washington, DC 20418; tel. 1-800-624-6242; in Washington, 334-3313.

NASA Project Status Reports (GAO/NSIAD-90-40; 44pp, no charge), report by the General Accounting Office, Congress's investigative service, requested by key legislators in NASA affairs, seeking an examination of the agency's chronically failing system for tracking costs and progress of its mega-projects which, GAO notes "could triple [in cost] by the year 2000." The likely explanation is that NASA would rather not know, as is suggested by GAO's findings on the 1988 Magellan mission to Venus, wherein, GAO reports, "some milestones were not the most current; the latest acquisition cost estimate lacked documentation; the source of the upper-stage development estimate was unknown; and NASA officials could not tell GAO who had developed the 'Progress, Problems and Pending Decisions' narrative or upon what data it was based." GAO adds, "NASA officials disagreed with GAO's findings but provided no documentation to support their position."

Also from GAO: *US-Japan Codevelopment: Review of*
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